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September 23, 2003

Ernest Johnson
Director, Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, AZ 85007

Re: Tucson Electric Power Company's Comments on the Cost Evaluation Working Group Report Recommendations: Docket No. RE-00000C-00-0377

Dear Mr. Johnson:

On June 30, 2003, the Cost Evaluation working Group (CEWG) submitted its report on the Environmental Portfolio Standard (A.A.C. R14-2-1618) to the Commission. Tucson Electric Power (TEP) participated in the CEWG. We believe that the CEWG Report contains a thorough and careful review of the status, costs, benefits, and impacts of the Environmental Portfolio Standard (Portfolio Standard) and we believe that the utilities have made significant advances in implementing the Portfolio Standard. We also support the policy and goals underlying the Portfolio Standard and believe that the Portfolio Standard is worth continuing as originally envisioned.

The CEWG presented two options for the Commission's consideration:

- **Option 1:** Take no action at this time and leave the annual renewable energy target at 0.8 percent of retail energy sales until a future review determines that either Portfolio Standard funding is sufficient, or solar generation costs have declined to the point for Portfolio Standard program success for all utilities at the 0.8 percent level, then increase the program percentage to 1.1 percent.

- **Option 2:** Continue the renewable energy requirement increase to 1.1 percent by 2007.

TEP will support either of the two Options presented by the CEWG that the Commission chooses to select. However, TEP respectfully asks the Commission to provide sufficient funding through the Portfolio Standard surcharge and System Benefit Charge funding to ensure a realistic opportunity for success in meeting the Portfolio Standard annual energy percentage goals with a prudent renewable energy development program.

TEP supports the continuation of the Portfolio Standard essentially in its current form for the reasons outlined below:

The Portfolio Standard has very aggressive solar energy percentage goals:

- When an ACC jurisdictional utility meets its post 2007 Portfolio Standard goals they will have an installed solar generation capacity of at least 12 watts per person living in their service territory. This includes accounting for the effects of multiplying factors and maximum use of manufacturing credit reductions.
- The countries of Japan and Germany, considered to have the most aggressive national solar development programs in the world, have both recently reached a point where they each have a PV installed capacity of just over 4 watts per capita, and both have announced that their PV incentive programs have ended.
- Both countries have noted they will create new PV incentive programs, but to date those programs have not been published.
- In addition, the solar resource in Arizona is significantly better than the resource in Japan or Germany, by a factor of nearly two.
- TEP will have an installed PV capacity of 5.3 watts per capita at the end of 2003, yet will only meet about 60 percent of its 2003 Portfolio Standard annual renewable energy goal.
- TEP, after less than three years of implementing the Portfolio Standard solar goals, will in 2003 produce more than twice the solar electricity per capita than the highly regarded solar development programs of Japan or Germany, yet not meet more than 60% of the 2003 Portfolio Standard solar goal. The Portfolio Standard sets a very aggressive solar energy development goal.
- Solar is Arizona's best renewable resource and should continue to be given higher development priority in order to continue the progress made in reducing the cost of solar development technologies. Solar technologies must become cost effective and solar equipment manufacturing must be developed in Arizona if Arizona is to achieve long term energy independence.

The Portfolio Standard is Producing Tangible Renewable Generation Results:

- While the Portfolio Standard has produced the development of over 7,000 kW of new solar PV installations in just three short years, the entire renewable development program of the state of New Jersey has produced just 1,209 kW of PV generation in the same time frame, even with an average subsidy of $4.01 per DC watt. Given that New Jersey has about 3 million electric customers and TEP and APS combined have about 1.3 million customers, and a 20 percent better solar resource in Arizona than in New Jersey, the average APS or TEP customer is already receiving nearly 16 times more solar electricity than their counterpart in New Jersey. The New Jersey program has also developed 305 kW of other renewable generation compared to TEP's non solar renewable generating capacity of 5,500 kW developed at the direction of the Commission.
- The California renewable energy development program, administered through the California Energy Commission (CEC), has been in operation for over 5 years

and has produced installation of about 20 MW of PV in the CEC jurisdictional areas, spending over $80 million in the process with subsidies for PV of up to $4.50 per watt. In comparison, TEP has developed, through the Portfolio Standard, 4.0 MW of PV in half the time. The utilities who participate in the CEC program have a peak demand of 22 times that of TEP. On the basis of per MW of load demand, TEP has installed through the Portfolio Standard four times the PV asset as that installed in a longer time through the Emerging Renewables program of the California Energy Commission.

- The TEP program has produced more installed PV capacity than the very highly regarded PV development program of the Los Angeles Department of Water and Power (LADWP) - on an absolute basis. While both programs were started in the August 2000 timeframe, TEP had an installed PV capacity of 2,850 kW at the end of 2002 compared to the LADWP program capacity of 2,600 kW. LADWP offers PV installation subsidies of up to $6.00 per watt and California has a better tax incentive program than Arizona for renewable generation. The results at the end of June 2003 were similar: TEP had installed 3,750 kW of PV and LADWP had installed 3.584 kW of PV. LADWP has about 3.5 times as many customers as TEP.
- The bottom line is that the Arizona Portfolio Standard is producing installed solar PV generating capacity results on a per capita basis that are significantly better than nearly every other highly publicized, highly regarded PV program, with the possible exception of the SMUD solar program, while still meeting the Portfolio Standard non solar renewable generation goals.
- A new high resolution wind model and map has been developed to better allow interested parties to identify areas with promising wind regimes for installation of survey towers.

<u>The Portfolio Standard is Meeting its Cost and Benefit Objectives:</u>

- The costs of meeting the Portfolio Standard are declining and the CEWG Report notes that the program is creating benefits, both expected and unexpected, for the citizens of Arizona.
- Large commercial size solar hot water heating and landfill gas generation projects have been cost effective to date as compared to conventionally fueled generation sources.
- It has been recognized from the beginning of the Portfolio Standard that the costs of photovoltaics and other solar generation systems would be higher than the cost of conventionally fueled generation, but that the Portfolio Standard would drive reductions in those costs. Those cost reductions are occurring.
- A true net metering pilot program has been implemented and data regarding participation rates and the cost of implementation is available.

Innovative Utility Business Plans are Creating New Markets for Solar Development:

- While much has been reported about additional opportunities for leveraging limited Portfolio Standard funding through development of customer sited solar generation, the reality is that through an aggressive utility PV development program the cost of developing kWh of solar electricity for the utility is lower from large, utility scale distributed generation resources than from customer sited, utility subsidized PV installations of less than 20 kW in size.
- Large PV systems are more efficient than small PV systems and have higher reliability factors as noted by the CEWG Report and comments from the Western Resource Advocates.
- The initial cost of a large PV system on a $/watt basis is significantly lower than the initial cost of a small PV system, typically by 40 percent.
- Utilities can take advantage of Federal Investment Tax Credits, getting 10% leverage on funds.
- Utilities do not incur lost revenue from utility owned PV systems as they do from customer sited solar generation, further leveraging Portfolio Standard funds.
- Utilities can reinvest the revenues derived from sale of solar generated electricity at wholesale market rates at the time of production into additional funding for renewable generation in following years. As the amount of energy being developed from these renewable sources increases in future years, the solar energy revenues produced annually can approach the Portfolio Standard surcharge amount collected from customers, leveraging dollars invested today for future renewable development. These new dollars will be available as the cost of solar technologies declines in future years, further increasing the effectiveness of those revenues for funding solar generation development in the future.
- A TEP financial model analysis, presented to the CEWG in October 2002, demonstrated conclusively that providing a subsidy in 2003 of $2 per AC watt for customer sited PV systems through the SunShare Option 1 program produced Portfolio Standard Solar credits at a cost 50% higher than the cost of Portfolio Standard Solar credits produced at the Springerville Generating Station Solar System in 2003. This model was never challenged during the course of developing the CEWG Report.

Green Pricing Programs Are Not Well Subscribed:

- Arizona utility Green Pricing program customer participation rates are typically less than 0.5 percent.
- Hawaii has developed customer participation rates of nearly 0.8 percent with program that have been in place for twice as long as the Arizona programs.
- Funding from Green Pricing programs is not sufficient now nor is it expected to be sufficient in the next five years to fund a credible solar renewable energy development program:

Financing Aspects of the Portfolio Standard:

- The Portfolio Standard funding mechanism allows for development of finance free renewable resource asset development since it allows for "Pay as you Build" financing. By eliminating the financing costs of high initial cost, low operating cost generation like solar, a dramatic reduction in the life cycle cost of PV generation can be realized.
- In addition, the use of up front funding reduces the financial risk of entry into long term contracts for energy developed from a rapidly declining cost technology. Long term contracts entered into for energy from a declining cost technology like solar will always have a higher net present value per unit of energy than building the technology with the same cash flow as dollars are available. Long term contracts are appropriate when the technology has matured, the prices are stable and robust competition is supported.

Development of a True Portfolio of Renewable Resources:

- There was a concern during development of the Portfolio Standard that one renewable solar technology would be the lowest cost and that only that solar technology would be developed. The utilities have successfully diversified their renewable solar energy development technologies.
- The Arizona utilities are providing healthy incentives for the sustainable development of small, customer sited solar PV systems. Those programs are benefiting from cost reductions effected through mass purchases for the large utility scale distributed generation systems. These small PV system development programs are developing Portfolio Standard Solar credits at a higher overall cost than the utility scale PV systems.
- The large, utility scale distributed generation solar generation systems employ a wide variety of technologies. Tracking and non tracking PV technologies are being developed. Both crystalline and thin film PV technologies are being developed. The solar industry is provided with operational results for their use to improve their products in terms of production, reliability and cost. Many different types of inverters are being employed and manufacturers are being provided with operational data to improve their products.

Development of Technology Improvements and Cost Reductions:

- Designs to harden PV systems from the detrimental effects of Arizona's monsoon lightning are being developed.
- Reductions in Balance of System costs are being created through innovative designs and construction practices at both large utility scale PV installations and small customer sited PV installations.

Creation of a Database of the Intermittency of Renewable Resources:

- The Portfolio Standard is providing a wealth of real time data for use by utilities in understanding the characteristics of intermittent renewable resources like solar and wind.
- The utilities are beginning to use this data to determine the capacity value of intermittent resources.
- The utilities are beginning to use this data to develop resource forecasting methods,
- The utilities are developing the tools to analyze the data for use in integrating intermittent generation resources into the operational plan of generation dispatch.

The Portfolio Standard should be continued in essentially the form which it currently exists. We suggest that any consideration of changes to the rule should be limited to increasing the cap on the surcharge. The Portfolio Standard is producing significant positive results for Arizona. It would not be beneficial to modify any other terms of the Portfolio Standard at this time, as those changes could produce more confusion than good, reducing the strong momentum the Portfolio Standard has created in its first three years.

Thank you for the opportunity to provide comments on the Portfolio Standard. If you have questions or comments please contact me at (520)-745-3422.

Best regards,

David Couture

David Couture
Director, Regulatory Services

Enclosures

Cc: Docket Control (original and thirteen copies)
Ray Williamson, Arizona Corporation Commission
Steve Glaser, Tucson Electric Power
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